and the mould was then washed away, by a strong current of water, from the bases of their stems, so that the fibrous roots only of the plants entered into the soil. The fibrous roots of this plant are perfectly distinct organs from the runners, which give existence, and subsequently convey nutriment to the tuberous roots; and as the runners spring from the stems only of the plants, which are, in the mode of culture I have described, placed wholly out of the soil, the formation of tuberous roots is easily prevented; and whenever this is done, numerous blossoms will soon appear, and almost every blossom will afford fruit and seeds. It appears not improbable, that by introducing the farina of the small, and very early varieties into the blossoms of those of larger size, and somewhat later habits, moderately early varieties, adapted to field culture, and winter use, might be obtained; and the value of these to the farmer, in the colder parts of the kingdom, whose crops of potatoes is succeeded by one of wheat, would be very great. I have not yet made any experiment of this kind, but I am prepared to do it in the present spring.

Method of making an artificial Fire proper for Signals; by M. de Zach.

(From his Astronomical and Geographical Correspondence.)

The composition of the powder of which this fire is made, has hitherto been kept secret by the English, because they make it an object of commerce, and sell it to the French astronomers, who use it for signals, &c. M. de Zach gives the following account of this powder, and of the method of preparing it.

It is sold in wooden boxes; the fire produced from one of the boxes, of six inches diameter and four inches high, which was lighted by General Roy on the English coast, was seen very distinctly by M. Mechain with the naked eye on the French coast, at a distance of forty miles over the sea, in overcast and cloudy weather.

The fire from another of these boxes, lighted by M. Legendre at Dunkirk, was seen with the naked eye by M. Cassini at Cape *Blanc-nez*, as distinctly as the planet Venus when brightest, although the distance was 20,000 toises.

The powder is prepared in the following manner:

Twenty-four parts of saltpetre, seven parts of flowers of sulphur, and two parts red arsenic, are pulverized and well mixed together. This mixture is enclosed in round or square boxes of thin wood; in general the height of the round boxes is half their diameter; and the square are made double the size of the round. They are closed with a cover of the same wood, in the middle of which a small hole is made by which the powder is lighted.

When these boxes are made for carriage, paper is pasted all round them, and also over the hole in the lid, that the powder may not be scattered. When the box is lighted, the paper that joins the covering of the lip is first taken off, and then that which is over the hole; it is lighted with a common match, and takes fire in an instant without explosion. It spreads a very brilliant light, with a little smoke, which the person who lights it must be careful to avoid; a box of six inches diameter and three inches high, burns nearly for the space of three minutes, and the light may be perceived a little before sun-set at the distance of 36,000 toises. The light of this fire is so dazzlingly bright, that it affects the eyes of those who approach very near to it, in the same manner as the sun, rendering them incapable of distinguishing objects for some time afterwards.

The price of this powder is nearly the same as common gunpowder.

The matches are prepared as follows:—four parts of refined saltpetre are pulverized, and well mixed with two parts of gunpowder, two parts of charcoal, and one part of flowers of sulphur, the whole is then passed through a sieve. This powder is put into paper cartridges the length of the quill of a pen, the cartridges are made of strong paper rolled round a stick two feet long, and the powder is pressed in with a piece of round wood of the same dimensions.

These matches are fastened to a stick of a suitable length, the edge of the paper is cut with scissars, and the match is lighted by a candle. The effect never fails, and the matches are proof against wind and rain. In order to extinguish them, the lighted end must be cut off.

An artificer of Marseilles proposes to make these matches of a mixture of eight parts of flowers of sulphur, four of saltpetre, and two of gunpowder, the whole

reduced to a fine powder, and well mixed together.

Account of an Electrical Telegraph; by M. Soemmering.

(From Uber Electrischen Telegraphen.)

The author of this invention was led to it by remarking, that the phenomenon of the decomposition of water by the action of metallic points plunged therein, and made to communicate with the poles of a voltaic pile, takes place even when the extent of the circuit, which the electric fluid runs over, is very considerable, such as several thousand feet.

It occurred to him, that by applying to telegraphic communications, this influence, at once so rapid and powerful, which, if it could be substituted for the optical effects which are always suspended by night or in cloudy weather, would have on the principles of the ordinary telegraph unequivocal advantages.

The first attempt fulfilled his expectations.

The apparatus is composed of an ordinary voltaic pile. One-tenth of the disks of zinc and silver are sufficient. It is established by beginning with the zinc, then a moistened piece of felt, and the silver. Thus the pole that gives the hydrogen in the decomposition of the water is below, and the pole of the oxygen is above.

From these two poles proceeded two conducting wires of flexible metal, each terminated by a small brass peg, broad at the top, that it may be taken in the fingers. These pegs are made to be fixed at pleasure in any one of the twenty-seven holes that are bored, vertically towards the extremities of an equal number of small brass cylinders, ranged horizontally beside each other, without touching; along the upper cross piece. Each of these cylinders correspond with a letter of the alphabet, from A to Z, and there are besides three additional signs, which contribute to the precision of the telegraphic language, and complete the number of twenty-seven. The holes in the cylinders, and also the pegs, are made a little conical, in order that the reciprocal contact may be always certain.

Each of the cylinders crosses in its whole thickness the piece that sustains them all, and at the end opposite that which receives the peg a small transverse hole is bored, through which a conducting wire is passed, and the end afterwards twisted. These wires converge, and are of an indefinite length; that is, equal to the distance between the person who composes the telegraphic communication and the person who reads it.

Method of coating Linen Cloth, so as to render it impenetrable to Air and Water.

From Magazin der Erfindungen.

Boil slowly a quarter of a pound of gum elastic in a pint and a half of boiled linseed oil. When the gum is dissolved add to it about two quarts of boiled oil, one pound of resin, one pound of yellow wax, and as much litharge, and boil the whole together. This mass must be laid on the cloth while yet warm, which retains its flexibility, and may be employed in the place of leather for the pipes of fire engines, especially if the cloth be made of hemp and without seam.

LIST OF NEW PUBLICATIONS.

BIOGRAPHY.

THE Life of a Dissenting Minister; written by himself. With occasional reflections, illustrative of the education and professional state of the Dissenting Clergy, and the character and manners of the Dissenters in general, 5s. 6d.

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View of the progress and present state of Animal Chemistry; by I. J. Berzelius, M.D., £.2 12s. 6d.

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Mustapha; a tragedy, 3s.

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